Subsurface Investigation
Franklin Falls Dam, N.H.

Contract No. DACW33-85-D-0012
Del. order No. 0002

STONE & WEBSTER ENGINEERING CORPORATION

245 SUMMER STREET, BOSTON, MASSACHUSETTS

ADDRESS ALL CORRESPONDENCE TO P.O. BOX 2325, BOSTON, MA 02107

W. U. TELEX: 94-0001
94-0977

BOSTON
NEW YORK
CHERRY HILL, N.J.
DENVER
HOUSTON
DALLAS
PORTLAND, OREGON
RICHLAND, WA
WASHINGTON, D.C.

DESIGN
CONSTRUCTION
REPORTS
EXAMINATIONS
CONSULTING
ENGINEERING

Mr. Richard D. Reardon
Chief, Engineering Division
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254

October 5, 1987

J.O.No. 15611.02

CONTRACT DACW33-85-D-0012
DELIVERY ORDER 0002

Dear Mr. Reardon:

In accordance with Delivery Order No. 0002, dated July 6, 1987, attached is one copy of our final report with originals for the Inspection, Exploration, and Piezometer Installation at Franklin Falls Dam, Franklin, New Hampshire. This report includes only boring No. FD-87-1 (downstream side of the dam). Boring FD-87-2 (on the upstream side) was completed by the U.S. Corps of Engineers - New England Division staff.

Should you have any questions, please do not hesitate to call the undersigned at (617) 589-2171.

Very truly yours,

Nuri T. Georges
Project Manager

Attachments

NTG:ps

ENGINEERING REPORT

for

CONTRACT NO. DACW33-85-D-0012
DELIVERY ORDER NO. 0002

SUBSURFACE INVESTIGATION

Franklin Falls Dam
Franklin, New Hampshire

Prepared for:

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, Massachusetts 02254

October 1987

Stone & Webster Engineering Corporation
Boston, Massachusetts

TABLE OF CONTENTS

1.0 GENERAL

1.1 Authorization

The work reported herein was performed under Contract No. DACW33-85-D-0012, Delivery Order No. 0002 dated July 6, 1987. The authority for this project was obtained from Department of the Army, New England Division, Corps of Engineers.

1.2 Project Site

The project site is located at Franklin Falls Dam, Franklin, New Hampshire.

1.3 Purpose

The purpose of this work order is to complete the dam safety investigation at the Franklin Falls Dam.

1.4 Scope of Investigation

The inspection, exploration, and piezometer installation instructions provided by the Army Corps of Engineers, New England Division, are included in Appendix A. Field procedure for foundation liquefaction assessment is included as Appendix B.

The subsurface investigation program consisted of drilling through the compacted granular material of the dam without sampling using the ODEX method of advancing the casing. Once into the foundation material, the borehole was advanced using revert mud and the foundation material was sampled at 2.5 ft intervals. Cumulative blows using 140 lb hammer were recorded for each 0.1 ft of sampler penetration to the top of bedrock as shown in Appendix C. Bedrock was cored a distance of 5 ft. Two piezometers were installed in the borehole as shown in the piezometer installation report included in Appendix E.

It should be noted that only one boring, FD-87-1, was completed under the direction of a Stone & Webster engineer (Ms. Janice W. McCoy).

Boring field logs (FD-87-1) are included in Appendix D. Inspection of work associated with completing boring FD-87-2 was performed by the Corps of Engineers staff, New England Division, and is not included in this report.

2.0 QUALITY CONTROL

2.1 Equipment

The following tools and equipment were used to perform the work:

a. Core Drill: The drill rig used was a Failing Model 1500, tilt bed truck rig.

b. Drive Hammer: The drive hammer used to advance the split spoon sampler was a 140 lb safety hammer.

c. Casing: The casing through the embankment was 6.5 in. OD ODEX casing advanced using air pressure. For boring FD-87-1, 4.5 in. OD casing was advanced to a depth of 120 ft in order to seal off the coarse sand filter zone at the bottom of the ODEX casing (approximately 80 ft) which was being washed into the samples during drilling operations. A 5 in. roller bit was used to advance the 4.5 in. OD casing.

d. Drill Rods: "N" size rods with a 3 7/8 roller bit was used to advance the boring between samples. "A" rods with spiders were used during the sampling operations.

e. Rock Bit: Rock was cored using a 2.5 in. HQ core barrel and reaming shaft.

f. Piezometers: The piezometers consisted of a 2.0 ft long, 1.5 in. diameter porous stone connected to 3/4 in., Schedule 80 PVC riser pipe. The piezometer was protected by a 2.5 in. steel pipe through the protective rock layer.

2.2 Records

Records were kept of all activities and field procedures. Table 1 gives a description of the daily activities. The test boring log (FD-87-1) includes the following information:

Name of the project

Site location

Drilling agency

Ground elevation at boring location

Date boring performed

Hole number and designation

Depths at which samples or rock cores were recovered including top and bottom depths of each sampling interval

Method of penetration

Depth of penetration

Type of material encountered

Density of material encountered

Name of driller and inspector

Blows per 6 in. of penetration

Blows per 0.1 ft of penetration on separate form

Depth at which drilling fluid was lost

Depth to bottom of hole

Make and model of equipment

2.3 Procedures

a. Boring FD-87-1 was located by the U.S. Corps of Engineers, New England Division (NED), at Station 18+10, 149 ft offset downstream from the embankment centerline. The elevation was determined to be approximately 367.0 ft.

b. The borehole was advanced without sampling through the dam using ODEX equipment. Air pressure was used to remove cuttings from within the 6.5 in. diameter casing. Casing was installed to a depth of 80.5 ft.

c. Sampling began at a depth of 81.6 ft and the borehole was cleaned between samples with Revert mud and a 3 7/8 in. tri-cone roller bit. Samples were taken at 2.5 ft intervals and blows per 0.1 ft were recorded for a total length of 1.5 ft.

d. Samples were classified in the field. Representative samples were taken from the split spoon sampler and placed in 16 oz plastic jars with screw top lids. Jars were labeled both on the lid and with stick-on labels with the sample number, sampling interval, boring number, and blows per 6 in. The rock core was also classified in the field and placed in a wooden core box. Chain of custody log was maintained documenting custody between the field and delivery to the lab at NED. The chain of custody log is included in Appendix F.

e. Two piezometers were installed in the boring at different elevations. The boring was backfilled with sand and a bentonite seal was placed above the deep piezometer. Falling head tests were performed on both piezometers in order to verify that they were working properly. The piezometer tips are porous stone type with PVC riser pipe.

3.0 QUALITY CONTROL CERTIFICATION

I hereby certify that the above-mentioned records, equipment, and procedures were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the delivery order.

Certified on October 2, 1987

Nora T. Georges

N. T. Georges

Project Manager

TABLE 1

SUMMARY OF ACTIVITIES

Date	Activity
July 27	Monday: T. Wong and A. Firicano on site surveying borehole locations. Driller had left site to get supplies. Received instructions from T. Wong.
July 28	Tuesday: Drill crew working on equipment and had to leave site to get materials such as cable and wood planks.
July 29	Wednesday: Moved dozers to toe of embankment, downstream side. Driller does not have enough rods to complete boring, came with approximately enough to complete a boring 100 feet deep. He called his office to arrange for approx. 70 additional feet of rods and casing. Safety meeting held.
July 30	Thursday: Moved equipment in place to begin drilling boring A (now re-named FD-87-1).
July 31	Friday: Began drilling FD-87-1 and installing ODEX casing. Installed 41 feet of casing today.
Aug 3	Monday: Rainy day. Driller waiting for oil delivery for air compressor. Set casing to 71 feet. Hit water at approximately 65 feet.
Aug 4	Tuesday: Installed casing to 80.5 feet. Drill rig required maintenance, air compressor required oil and spread vermiculite to soak up oil spill on road. Moved soil drilling equipment to hole. T. Wong wants driller to use Revert when advancing boring, but driller brought mostly bentonite (per spec). Driller has some revert he will use and will try to get more sent up with additional rods, etc.
Aug 5	Wednesday: T. Wong, A. Firicano and V. Hom on site to observe soil sampling. Driller will clean with 4 inch tri-cone roller bit and N rods with revert and sample using A rods. Took two samples and cleaned to 86.6 feet. The gauge used to measure blows per 0.1 ft. could not be clamped to the casing, therefore, the driller held it in place on top of the casing. Safety meeting held.

Aug 6	Thursday: Continued soil sampling to 105. 4 feet.
Aug 7	Friday: Continued soil sampling to 120.4 feet. Inspection by N. Georges. Lost drilling mud between 117 and 118 feet.
Aug 10	Monday: Additional rods and casing arrived. Moved this equipment to hole. Informed driller that a decision to use 4 inch casing below the ODEX to a depth of 120 feet had been made. Cleaned hole with 5 inch roller bit. Rain at 1 p.m. stopped work.
Aug 11	Tuesday: Casing set to 120 feet. Continued soil sampling to 130.5 feet. Samples did not contain the coarse sand as before.
Aug 12	Wednesday: One driller's helper not present due to severe toothache. Second helper limping due to being caught by wrench when breaking rods yesterday. (He did not complain of being hurt at the time.) Took one sample. Drilling stopped at 10 a.m. to take helper to doctor to check leg. Doctor said helper should not work for 10 days. Helper will be going home.
Aug 13	Thursday: No drilling since one helper out with toothache and second helper en route.
Aug 14	Friday: New helper arrives. The other helper still out with toothache. Sample to 142.8 feet.
Aug 17	Monday: All necessary personnel on site. Continued sampling to top of rock. Very hot day. Safety meeting held.
Aug 18	Tuesday: Began to core rock. A. Firicano on site to inform inspector of piezometer tip elevations. Cored 5 feet of rock and began to install the deep piezometer.
Aug 19	Wednesday: Continue installing piezometers and backfilling boring. Difficulty removing 4 inch casing due to sand. Hammer was used to remove casing to approximately 85 feet.
Aug 20	Thursday: Completed piezometer installation and removal of all 4 inch casing. Performed falling head tests on piezometers. J. Hart and T. Wong on site. Driller left with Hart and Wong to visit Hopkinton Dam where his next job will be.
Aug 21	Friday: Removed ODEX casing. When pulling the ODEX casing,the shallow piezometer was also

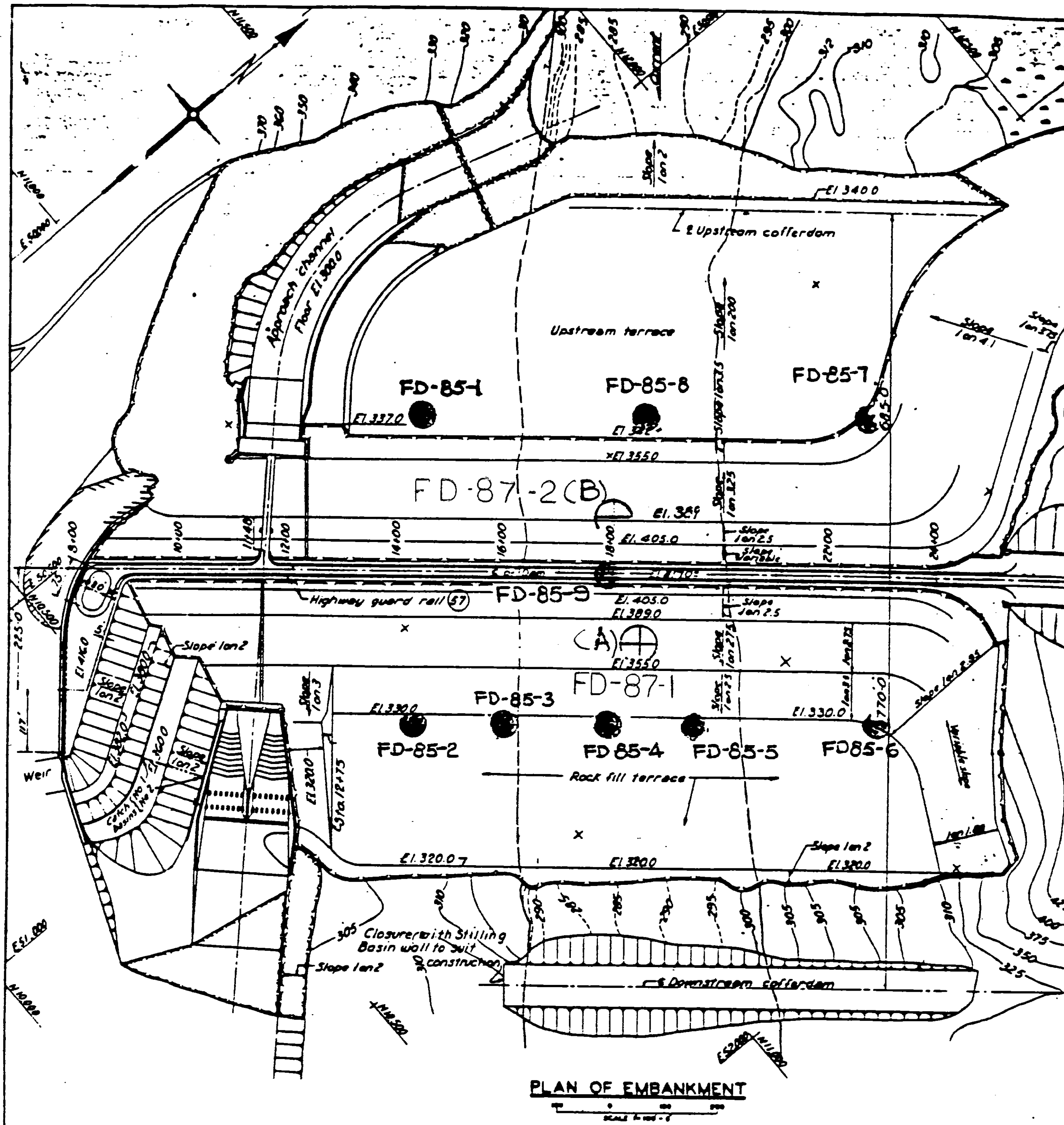
pulled up about 7 feet. Driller attempted to wash piezometer back down but was unsuccessful. Per T. Wong try to check piezometer for damage, re-test and attempt to use as is.

Aug 24 — Monday: Finished backfilling FD-87-1. Packed up equipment and moved it down slope with dozer. Performed falling head test on the shallow piezometer to make sure it was working, which it was.

Aug 25 — Tuesday: Dozer operator on site to assist in moving drill rig to upstream slope (FD-87-2). Hole re-located 4 feet down slope due to large boulder at the proposed boring location. Remainder of day spent moving eqiuipment to hole.

Aug 26 — Wednesday: Attempted to use ODEX through rocks. ODEX would not work due to break in air supply. Must try to get part re-machined or a new ODEX sent up. Inspector given approval to leave site and return samples for FD-87-1 to Corps of Engineers soils lab. Inspector will return to site if ODEX repaired.

Aug 28 — Friday: Stone & Webster was informed by Mr. Paul L'Hereux to complete draft report for work already conducted at the site and submit to NED. Stone & Webster will not be required to return to site since a U.S. Army Corps of Engineers inspector will supervise remaining drilling activity.



LEGEND

- EXISTING CASING
- PROPOSED BORING

FIGURE 1

APPENDIX A

Inspection, Exploration, and Piezometer Installation Instruction

SCOPE OF WORK

ATTACHMENT NO. 1

GEB REQUISITION NO. 87-80 - DACW 33-85-D-0012

DELIVERY ORDER NO. 0002

INSPECTION, EXPLORATION AND PIEZOMETER INSTALLATION INSTRUCTIONS

PROJECT: Test Borings and Piezometers

SITE: Franklin Falls Dam, NH (located on Attach 2)

PURPOSE: Obtain blow count and soil data for liquefaction evaluation and install piezometers.

1. SCOPE OF INVESTIGATION.

a. Two test borings shall be drilled by the Corps of Engineers at mid-slope locations on the embankment (Attachment No.2). The depths range from about 140 feet to 160 feet. Rockfill and embankment materials will not be sampled. Standard penetration tests (SPT) shall be done 2.5 ft. on center through the foundation soils to bedrock. Sections, extracts from construction specifications and SPT field procedures for liquefaction evaluation have been provided to you separately. Bedrock shall be cored to a depth of 5 feet. Two piezometers shall be installed in borehole A. Location of the tips will be determined by Mr. John Hart or Mr. Terry Wong after completion of the hole.

b. The Contractor shall provide a geotechnical inspector for the duration of the explorations and piezometer installation. The inspector shall be experienced in the SPT procedures required for liquefaction evaluations (copy provided separately). The inspector shall provide telephone reports to Mr. Terrance Wong or Mr. John Hart at (617) 647-8177/8389 every working day.

e. All samples shall be delivered by the inspector to the Corps of Engineers Headquarters in Waltham, Massachusetts. Sample delivery shall be coordinated with the Director, NED Materials and Water Quality Laboratory at (617) 647-8367/8392.

2. SITE CONDITIONS.

The site is at Franklin Falls Dam in Franklin, New Hampshire. Explorations will be done at mid-slope on both the upstream and downstream slopes (Attachment No. 2). SPTs and sampling shall be done in the foundation materials which begin at a depth of 80 feet in Borehole A and 90 feet in Borehole B. Anticipated conditions are shown in sections and specifications provided separately. The site shall be restored to its original condition after completion of the explorations. The restoration must be approved by the Project Manager, Odias LaRoche.

3. RIGHTS OF ENTRY.

The explorations are on Government-controlled land. Entry to the site will be arranged by NED.

4. COORDINATION.

The inspection work is scheduled to start on or about 20 July 1987. The exact starting date will be determined by drill rig availability. Therefore, Mr. Wong or Mr. Yatsevitch will notify the inspector of the start date. Mr. Wong or Mr. Yatsevitch (617-647-8177/8387) shall be notified immediately of any problems encountered.

Prior to demobilization of the drill crew and inspector, approval of the site restoration by the Project Manager, Odias LaRoche, must be obtained. Concurrence of approval from either Mr. Terrance Wong or Mr. John Hart must be verified.

5. EXPLORATIONS

The drive sample borings designated by letters A and B shall be numbered FD-87-1 and FD-87-2 in the order of their completion. The new numbers shall be indicated on the exploration logs and shown on a plan of explorations.

6. GOVERNMENT REVIEW

The Government will review the draft geotechnical report submittal as well as the completed report. Subsequent to such review the Contractor shall accomplish any corrections which may be directed as a result of Government review.

7. COMPLETION SCHEDULE.

Duration of field work is estimated to be twenty-six days. The geotechnical report shall be submitted in draft format for review by the Government postmarked no later than seven calendar days after completion of the field work. Review will take approximately five calendar days from receipt of draft report. The final geotechnical report shall be submitted postmarked no later than seven calendar days after receipt of the draft report including the action taken on comments.

8. QUALITY CONTROL.

You will be held responsible for the quality of the exploration plans and sketches submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level effort required for that submission, (b) elimination of conflicts, errors and omissions, and (c) the overall professional and technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.

APPENDIX B

Field Procedure Used for Liquefaction Assessment (Foundation)

FRANKLIN FALLS DAM

FIELD PROCEDURE USED FOR LIQUEFACTION ASSESSMENT (FOUNDATION)

STANDARD PENETRATION TESTS (2.5 FT CENTERS)

1. SCOPE. Apparatus and procedures shall be in conformance with ASTM D-1586-84 STANDARD METHOD FOR PENETRATION TEST AND SPLIT-BARREL SAMPLING SOILS, except as modified and/or amplified hereinafter.

2. A rope and drum system shall be used to lift the falling weight with two turns of the rope around the drum. The rope shall be replaced before it becomes worn or polished.

3. SPT hole diameter shall be kept to a diameter of about 4 inches in the foundation. Where casing is required, 4-inch ID diameter casing shall be used. A centering device (spider) shall be used to center the rods during the standard penetration test in the cased zone.

4. A-rods shall be used for sampling in the hole. The type and length of rods used shall be recorded on the boring log for each drive.

5. The hole shall be cleaned out to a depth of one foot below previous drive (sampling every 2.5 ft). The split-spoon shall be driven no more than 18 inches including slough, if any. The cumulative penetration resistance per blow, measured to the nearest 0.25 foot shall be measured and recorded with the aid of a graduated measuring rule attached to the casing. Where the penetration per blow is less than 0.1 ft, the measurement shall be made after every other blow, or less frequently, so long as at least one measurement is recorded for each 0.1 ft of penetration. The cumulative number of blows and the cumul ative penetration shall be measured and recorded. Depth to the beginning and end of drive shall be measured and recorded for each test. The amount of slough shall be recorded on the forms for the Standard Penetration Tests. Where the amount of slough exceeds 0.25 ft, the sampler shall be pulled from the hole and cleaned out before proceeding with the test.

6. Casing shall be used only in zones where an open hole cannot be maintained with mud. Where casing is required to maintain an open hole, the casing shall be at least 1 ft above start of next drive.

7. The drilling mud shall be used to support the hole and prevent heave of the bottom of the hole. The weight and viscosity of the drilling fluid shall be controlled so that the cuttings are effectively removed from the hole. Cuttings shall be removed from the hole by stopping rotation at the required depth and maintaining circulation until the final cuttings are removed. The hole shall be cleaned out to the bottom of every SPT sample with a fishtail bit fitted with upward deflectors of the circulation parts.

APPENDIX C

Standard Penetration Tests
(Blows per 0.1 ft)

APPENDIX D

Field Boring Log

APPENDIX E

Piezometer Installation Report

PIEZOMETER INSTALLATION REPORT

PROJECT: Franklin Falls Dam | DATE: Aug 18, 1987

LOCATION (STA): 18+10 | OFFSET FROM CENTER LINE: 149' Down Stream | PIEZ NO.: FD-87-1A

PIEZ TYPE: Porous Stone | DEPTH OF PIEZ: 149' | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): Sand | SOIL SAMPLE NO.: J-27 | BORING DIAM: 4" (bottom)

METHOD OF INSTALLATION: Installed in boring FD-87-1

TYPE OF PROTECTION FOR PIEZ: 2 1/2" Steel casing (21.5') | VENT: none

GROUND ELEV.: 367.0 | ELEV. TOP OF RISER: 370.2 | ELEV PIEZ TIP: 218.0

FILTER: Sand | FROM ELEV: 208.7 (Bottom of hole) | TO ELEV: 225

SEAL: Bentonite | FROM ELEV: 225 | TO ELEV: 233.7

INSTALLED BY: COE- Mobile | CONTRACT NO.: D.O. # 0002 | FOREMAN: J. Trimm

DATE OF INSTALLATION: 8-18-87 TO 8-21-87 | DATE OF OBSERVATIONS: See below

METHOD OF TESTING PIEZ.: Falling head Test 8-20-87

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER ~~FEET~~ m	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER ~~FEET~~ m	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
	0	0		5	3.87			
	1	3.50		10	4.00			
	2	3.72		15	4.10			
	3	3.78		20	4.18			
	4	3.82						

REMARKS: Deep piezo painted White + Threads at Top
Bottom of piezometer at 35.80 meters
Water level before Test at 19.65m from Top of riser
on 8-21-87, water at 17.22 m below grade
On 8-24-87, Water at 18.40 m. below grade
(152.2' of riser, porous stone + connection)

James W McCoy
INSPECTOR

FIG. No 10

FORM G-5-O

PIEZOMETER INSTALLATION REPORT
STONE & WEBSTER ENGINEERING CORP.

PIEZOMETER NO.	FD-87-1A
J.O. NO.	15611.02

SITE Franklin Falls Dam

DATE 8-18-87 TO 8-19-87 DRILLER J. Trimm INSPECTOR JW McCoy

COORDINATES _____ _____ GROUND ELEV. 367.0

INSTALLED IN BORING _____ ELEV. TOP OF LEADS. _____

RIG & CREW TIME _____

DETAILED INSTALLATION DESCRIPTION :

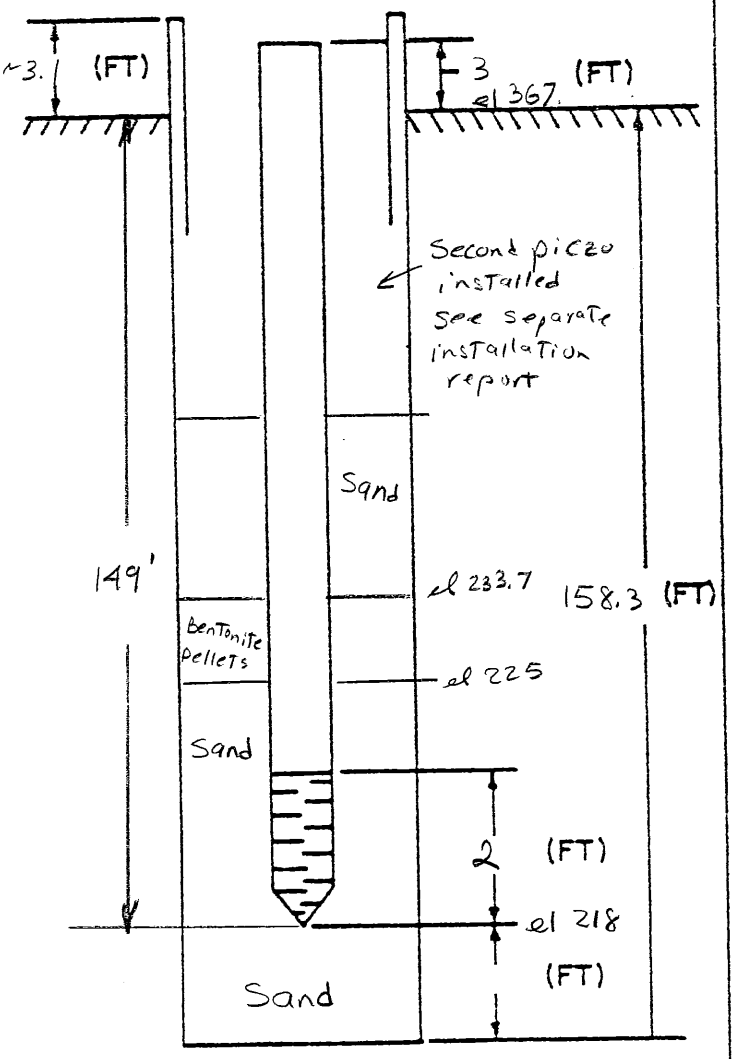
Filled hole with Sand TO 149'
Set piezo and backfilled with
Sand to el. 225. Bentonite
pellets installed to el. 233.7.
Sand placed to approx 89'
for shallow piezo.

DESCRIPTION OF PIEZOMETER TIP AND STAND PIPE ASSEMBLY

Porous stone Tip. 1 1/2" diam, 2' long
3/4" PVC riser pipe
Top painted white

DESCRIPTION OF SOIL AT TIP ELEVATION :

Sand, medium to fine,
Trace nonplastic fines,
very dense



NOTE : SKETCH IN ALL COMPONENTS PERTINENT TO THE INSTALLATION WITH APPLICABLE DIMENSIONS EG : FILTER SAND, SEALS, GROUT, CASING, ETC.

PIEZOMETER INSTALLATION REPORT

PROJECT: Franklin Falls Dam | DATE: 8-24-87

LOCATION (STA): 18+10 | OFFSET FROM CENTER LINE: 149' Dam Stream | PIEZ NO.: FD-87-1B

PIEZ TYPE: Porous Stone & 3/4" riser | DEPTH OF PIEZ: 82.5 | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): Gravel | SOIL SAMPLE NO.: J-1 | BORING DIAM: 4" +

METHOD OF INSTALLATION: Installed in boring FD-87-1

TYPE OF PROTECTION FOR PIEZ: 2½ steel pipe (21.5' deep) | VENT: none

GROUND ELEV.: 367.0 | ELEV. TOP OF RISER: 370.5 | ELEV PIEZ TIP: 284.5

FILTER: To grade | FROM ELEV: 233.7 | TO ELEV: 367

SEAL: added around protective Seal within Top 20' | FROM ELEV: | TO ELEV:

INSTALLED BY: COE-Mobile | CONTRACT NO.: 0002 | FOREMAN: J. Trimm

DATE OF INSTALLATION: 8-20-87 to 8-24-87 | DATE OF OBSERVATIONS:

METHOD OF TESTING PIEZ.: Falling Head Test (8-24-87)

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER ~~FEET~~ m	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER ~~FEET~~ m	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER ~~FEET~~ m
	0	0	1	4	13.60		25	17.09
	30 sec	10.90		5	14.46			
	1	11.32		10	15.30			
	2	11.95		15	16.02			
	3	12.50		20	16.61			

REMARKS: Difficulty installing this piezometer, originally set at 89' below grade, while pulling casing, piezo pulled up 7.5' and could not be reset. Ran falling head Test & piezo seems to be working satisfactorily.
Water level at 18.73m below grade on 8-21-87 (19.68m below riser)
18.60 m below grade on 8-24-87 (19.55m below riser)

James W McCoy
INSPECTOR

FIG. No 10

FORM G-6-O

PIEZOMETER INSTALLATION REPORT
STONE & WEBSTER ENGINEERING CORP.

PIEZOMETER NO. FD-87-1B

J.O. NO. 15611.02

SITE Franklin Falls Dam

DATE Aug. 24, 1987 DRILLER J. Trimm INSPECTOR JW McCoy

COORDINATES _____ _____ GROUND ELEV. 367.0

INSTALLED IN BORING _____ ELEV. TOP OF LEADS. _____

RIG & CREW TIME _____

DETAILED INSTALLATION DESCRIPTION :

Began installing piezo. Aug. 19 after deep piezo set. Filled hole with sand TO 89.2' depth and set piezo when pulling ODEX casing The shallow piezo pulled up 7.1' and could not be reset. Piezo. Tested and works satisfactorily. Protective pipe 2½" x 21 ASTM 120 steel pipe

DESCRIPTION OF PIEZOMETER TIP AND STAND PIPE ASSEMBLY

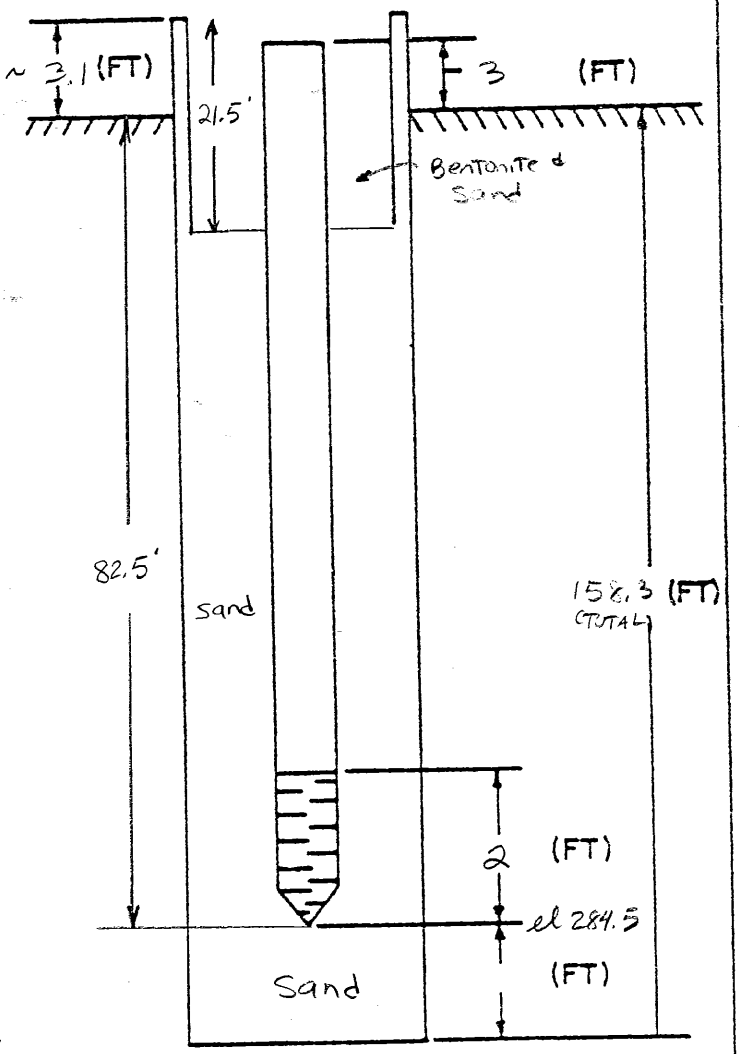
Porous stone tip 1½" diam, 2' long

¾" PVC riser pipe

Riser pipe cut at top

DESCRIPTION OF SOIL AT TIP ELEVATION :

Gravel and sand



NOTE : SKETCH IN ALL COMPONENTS PERTINENT TO THE INSTALLATION WITH APPLICABLE DIMENSIONS EG : FILTER SAND, SEALS, GROUT, CASING, ETC.

APPENDIX F

Chain of Custody Log

J.O. No. 15611. 02 Page 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION
CHAIN OF CUSTODY LOG
CORPS OF ENGINEERS, NEW ENGLAND DIVISION
CONTRACT NO. DACW 33-85-D-0012, DELIVERY ORDER 0002

ITEMS DELIVERED:

Jar Samples	FD-87-1 3 boxes (J-1 TO J-28)
Bottles	
Core Boxes	1 box (5' run)
Undisturbed Samples	
Sample Logs	FD-87-1
Sample Bags	

	DATE & TIME RECEIVED	DATE & TIME TRANSFERRED	SIGNATURE	CONDITION	COMMENTS
1.	8-26-87	8-26-87	JW McCoy	Good	
2.	8/26/87	8/26/87	C.J. Tuck	GOOD	
3.					
4.					
5.					
6.					

APPENDIX G

Daily Log of Field Explorations

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-5-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam, Franklin, NH

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER mostly sunny, 75+

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		80.5	86.6	6.1	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. McCoy	8
J. Trimm	8
J. Cooks	8
L. Bulter	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Set up for soil borings.
Started [illegible] sampling 1:30pm
On site - Terry Wong, Tony Fuenes
Victor Ham (from Waltham Corps of Engineers)
Had to hold [illegible] on top of [illegible] while
taking soil samples. Tried [illegible] [illegible]
[illegible] [illegible] it is not successful.
Took 2 samples & finished by closing
to 86.6 ft.

T. Wong [illegible] [illegible] [illegible] forward
sample jar [illegible]

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

continue soil sampling

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 2-6-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, warm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		86.6	105.4	18.8	Sand & silty sand

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	8
L. Butler	8
J. Cooks	8
J. McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Continued coring and sampling - took samples J-3 TO J-9

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Will continue coring and sampling

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-7-1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Cloudy low 70

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1	Downstream Face	106.2	120.4	14.2	used mud for circulating fluid
					Silty f. Sand

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trim	8
Leon Butler	8
Vessie Cooks	8
Neal T. Georges	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Six split spoon samples were recovered today. The soil samples recovered consisted of light brown micaceous silty, fine to medium sand (very dense). Only one sample between depth 111 and [illegible] encountered occasional thin layer under 1/4" thick of gray [illegible] clay.

Approximately 70 to 100 gallons of drilling fluid was lost at depth between 117 and [illegible] ft.

Drilling was stopped at about 2 3/4 pm because drilling crew ran out of [illegible] to [illegible].

Called Mr. Wong (PM) and he informed us that both rods and casing will be arriving Monday. Told me to [illegible] [illegible] to [illegible] the 4" casing inside the 6" casing and to drive it to firm soil but not below depth 15[illegible]' to [illegible] drilling fluid [illegible] [illegible] to [illegible] [illegible] in the [illegible] [illegible].

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Install 4" casing & continue soil sampling

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-10-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Rainy

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1				0	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	5.5
L. Butler	↓
J. Cooks	↓
J. McCoy	↓

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Will install 4" casing to 120'
per discussion with Terry Wong. This
will keep coarse sand filter
at base of dam from being
[illegible] with hole. Hole [illegible]
and drillers left at 1 pm due to
rain

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Continue to set casing - as discussed
with Terry Wong ; install 4" casing 120' deep
to keep sand filter at base of dam from
falling into borehole

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug 11, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, windy Warm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD87-1		120.4	130.5	10.1	Silty fine sand

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	8
Leon Butler	8
Jessie Cooks (12:45-1:30 dent.ist)	8
Janice McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Installed 4" casing to 120 ft.

Sampled J-16 TO J-19; dense silty fine sand. Good samples. Jesse left after lunch to go to the dentist for toothache

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Continue with sampling

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-12-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, warm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		130.5	132.9	2.4	Silty fine sand

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	3
Leon Butler	3
Janice McCoy	3

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

_____
CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Took sample J-20, J. Cocho not present
due to [illegible], Leon limping
Jerry & Leon left at 10 AM to take Leon
to the doctor for what may be a leg operation
Leon [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] breaking [illegible]
[illegible] did not complain of being hurt
at the time.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Will work if replacement driller's helper
arrives.

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-13-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, Warm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1				0	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	0
J. McCoy	0

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Driller had no helper. L. Butler returned home last night. J. Cooks still out with severe [illegible].
New helper should be on site tomorrow.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Should continue soil sampling if replacement driller's helper arrives

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug 14, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Foggy am, Sunny & warm pm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		131.5	142.8	11.3'	SILTY sand TO Sandy gravel

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	8
Isreal Allison	8
Janice McCay	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

_____
CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

No work yesterday due to change in drillers helpers. [illegible] replaced by Israel [illegible]. [illegible] did not work due to toothache. Continued soil sampling J-21 through J-24. Driller [illegible] [illegible] [illegible] [illegible] [illegible] working with just one helper.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Continue soil sampling, may reach rock & begin coring.

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug 17, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, very hot

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		141.5	152.1	10.6	Sand + sandy gravel

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	8
Isreal Allison	8
Jessie Cooks	8
Janice McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Continued soil sampling - samples S-25 to S-28 (top of rock). Rock at 152.1 ft. moved rock core barrel + piez. tubing to hole. Will core rock + set piezos tomorrow.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Core rock + set piezometers

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug 18, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Hot, Sunny

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1		152.1	160.2	8.1	rock

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	8
Jessie Cooks	8
Isreal Allison	8
Janice McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Cored rock. Took time to clear through the layer of "boulders" above rock & get boring [illegible] enough for rock boring. Should have cored from 152.1 to 157.6. However, bottom of hole at 158.3' based on rods, driller started rock coring at 153.2, probably hit a boulder at top of rock (152.1).

Attempted installation of deep piezometer at 150' per Tony Friedman [illegible] was some trouble getting sand to flow down hole without bridging. Finally put piezo down hole with plastic sand and [illegible] plug

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Continue installing piezometers.
Need to get black pipe protective casing for piezo through embankment (per Tony Friedman)

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug. 19, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Hot, sunny

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1					pressuremeter installation

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm	8.5
Jessie Cooks	8.5
Isreal Allison	8.5
Janice McCoy	8.5

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Installed deep piezometer in FD-87-1
Started [illegible] of piez at 90'.
Had to pull [illegible] big casing and
pulled casing [illegible] [illegible]. Piezo
moved tubing [illegible] removed.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Continue piezometer installation

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT
Summit oil filter and [illegible]			
(by driller)			

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE Aug 20, 1987

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, warm

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
Jerry Trimm (2.5 hrs offsite)	8
Jessie Cooks	8
Isreal Allison	8
Janice McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Completed installation of piezometer. Began pulling 6½" NX casing (removed 16'). Performed falling head tests on the piezometer.

Visit by John Hart + Terry Howe on site, TDH [illegible] to Hopkinton dam for 2½ hrs.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Remove NX casing + complete piezometer installation

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-21-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER cloudy

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1				0	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	8
J. Cooks	8
I. Allison	8
J. McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

_____
CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Continue removing ODEX casing and backfill around piezometers. Shallow piezo [illegible] top 7' while pulling casing. Attempts to work piezo [illegible] were not successful. Piezo top appeared undamaged from [illegible] the [illegible]. Pulled all ODEX casing and set 1½" protective casing through top 20± ft

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Read piezos & pack up to move to next hole

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-24-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, cool

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL
FD-87-1				0	

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	8
T. Allison	8
J. Cooks	8
J. McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

_____
CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Finished FD-27-1. Picked up and
move equipment (except drill rig)
[illegible]. Next hole [illegible]
[illegible] probably tomorrow

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Move to new D.C.

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-25-87

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, Cool

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	8
J. Cooks	8
I. Allison	8
E. Lagrone	8
J. McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Move drill to upstream end of FD-27-2.
Rain at 2:45

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

Begin installing VDEX

FIELD PURCHASES

ITEM	AMOUNT

ITEM	AMOUNT

NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U.S. ARMY
WALTHAM, MASSACHUSETTS

FOUNDATIONS & MATERIALS BRANCH

LOG NO. _____ DATE 8-26-77

DAILY LOG OF FIELD EXPLORATIONS

PROJECT Franklin Falls Dam

TEMPORARY ADDRESS _____

LOCATION WHERE CAN BE REACHED _____

PHONE _____ TIME _____ TEMPERATURE: ___ MAX. _____ MIN. _____

WEATHER Sunny, cool

DRILLING TODAY

HOLE	AREA	FOOTAGE FROM	FOOTAGE TO	FOOTAGE TODAY	MATERIAL

TEST PITS OR AUGER BORINGS TODAY

HOLE	AREA	DEPTH	MATERIAL

HOLE	AREA	DEPTH	MATERIAL

PERSONNEL

NAME	HOURS
J. Trimm	8
T. Allison	8
E Lagrone	8
J. McCoy	8

PLANT USED

ITEM	HOURS	BREAKDOWN HOURS

_____
CHIEF OF FIELD PARTY

NED FORM DEC 63 198 REPLACES EDITION OF MAY 62 WHICH MAY BE USED UNTIL EXHAUSTED

(OVER)

NARRATIVE OF DAYS OPERATIONS

Began using IDEX. [illegible] not (cutting). Broke [illegible] IDEX and [illegible] in the [illegible]. Must get it repaired or [illegible].

Inspector left and delivered samples to NED lab. Driller will call when work recommences.

MAN-HOUR WORK BREAKDOWN

NAME	MOB.	DEMOB.	MOVING	DRILL OVB.	DRILL BEDROCK	PREV. MAINT.	EQUIP. FAILURE	LOST TIME (WEATHER)	INSP. & SUPER.	MISC.	TOTAL

WORK FOR TOMORROW

FIELD PURCHASES

ITEM	AMOUNT	ITEM	AMOUNT

APPENDIX H

Weekly Safety Meeting Reports

J.O. No. 15611.02 Page 1 of 3

STONE & WEBSTER ENGINEERING CORPORATION
WEEKLY SAFETY MEETING LOG
CORPS OF ENGINEERS, NEW ENGLAND DIVISION

TO: Safety Office, NED DATE HELD: 7-29-87

FROM: Field Engineer or Drilling Supervisor TIME: 11:30

THRU: Project Manager PERSONNEL PRESENT:
J. McCoy
Jerry Trimm
Leon Butler
Jesse Cooks
Luther Lewis

Weekly Safety meeting was held this date
Contract No. DACW 33-85-D-0012 Delivery Order 0002

1. SUBJECTS DISCUSSED (Note: delete, or add)
Individual Protective Equipment - Ear, hard hats, eye, feet
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
Fire Prevention - NA
Sanitation, First Aid -
Tripping Hazards - Trash, hose, nails in lumber -
Staging Ladders, Concrete Forms - NA
Hand Tools - wrenches, etc
Portable Power Tools - NA
Woodworking Machinery - NA
Equipment Maintenance (zero defects) - ropes & cables ok, new hoses
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring - NA
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts
Welding - NA
Excavations - NA
Loose Rock and Step Slopes - must be complied.
Explosives - NA
Water Safety - NA
Others -
Hospital & get info from LaRoche
Doctor
Hospital in Franklin - Driller knows where it is

PREPARED BY: J. McCoy
Field Engineer or Drilling Supervisor

2. Exposure:
Total on site job hours: 8 / day
Personnel

SIGNATURE: Mark F. George
Project Manager

3. FORWARDED TO: NED, Waltham, MA

STONE & WEBSTER ENGINEERING CORPORATION
WEEKLY SAFETY MEETING LOG
CORPS OF ENGINEERS, NEW ENGLAND DIVISION

TO: Safety Office, NED

DATE HELD: Aug 5, 1987

FROM: Field Engineer or Drilling Supervisor

TIME: 7:25 am

THRU: Project Manager

PERSONNEL PRESENT:
J. McCoy
Jerry Trimm
Jessie Simms
Leon Butler

Weekly Safety meeting was held this date
Contract No. DACW 33-85-D-0012 Delivery Order 0002

1. SUBJECTS DISCUSSED (Note: delete, or add)
Individual Protective Equipment - Ear, hard hats, eye -
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - Trash, hose, nails in lumber -
Staging Ladders, Concrete Forms - NA
Hand Tools -
Portable Power Tools - NA
Woodworking Machinery -
Equipment Maintenance (zero defects) - good condition
Hoisting Equipment - cables ok
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring - NA
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts
Welding - NA
Excavations - NA
Loose Rock and Step Slopes - very critical
Explosives - NA
Water Safety - NA
Others -

Fire, ambulance call 524-1945

PREPARED BY: James W McCoy
Field Engineer or Drilling Supervisor

2. Exposure:
Total on site job hours: 8
Personnel

SIGNATURE: Mark F. Senger
Project Manager

3. FORWARDED TO: NED, Waltham, MA

STONE & WEBSTER ENGINEERING CORPORATION
WEEKLY SAFETY MEETING LOG
CORPS OF ENGINEERS, NEW ENGLAND DIVISION

TO: Safety Office, NED

FROM: Field Engineer or Drilling Supervisor

THRU: Project Manager

DATE HELD: Aug 17, 1987

TIME: 11:30

PERSONNEL PRESENT:
Jerry Trimm
Jessie Cooks
Isreal Allison

Weekly Safety meeting was held this date
Contract No. DACW 33-85-D-0012 Delivery Order 0002

1. SUBJECTS DISCUSSED (Note: delete, or add)
   Individual Protective Equipment - Ear, hard hats, eye - wear hard hats ear protection safety shoes
   Prevention of Falls - watch rocks
   Safe Lifting Techniques - [illegible], try to keep stable
   Emergency Communications -
   Fire Prevention - NA
   Sanitation, First Aid - OK
   Tripping Hazards - Trash, hose, nails in lumber - rocks, [illegible]
   Staging Ladders, Concrete Forms - NA
   Hand Tools - NA
   Portable Power Tools - NA
   Woodworking Machinery -
   Equipment Maintenance (zero defects) - OK
   Hoisting Equipment -
   Ropes, Hooks, Chains and Slings -
   Electrical Grounding, Temporary Wiring - NA
   Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts
   Welding - NA
   Excavations -
   Loose Rock and Steep Slopes - very important
   Explosives - NA
   Water Safety -
   Others -
   site [illegible] drillers & helpers [illegible] picking up rocks & stepping on rocks

PREPARED BY: James W McCoy
Field Engineer or Drilling Supervisor

2. Exposure:
   Total on site job hours: 8/day
   Personnel

SIGNATURE: [signature]
Project Manager

3. FORWARDED TO: NED, Waltham, MA

Hole No.

DRILLING LOG | DIVISION NED | INSTALLATION | SHEET 1 OF 7 SHEETS

1. PROJECT: Franklin Falls Dam
2. LOCATION (Coordinates or Station): Franklin NH
3. DRILLING AGENCY: CE Mobile Alabama Dist
4. HOLE NO. (As shown on drawing title and file number): A | FD-87-1
5. NAME OF DRILLER: Jerry Trimm
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 153.2 FT
8. DEPTH DRILLED INTO ROCK: 5.1'
9. TOTAL DEPTH OF HOLE: 158.3
10. SIZE AND TYPE OF BIT: 4" roller bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 27 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER: ~305
16. DATE HOLE: STARTED 7-31-87 | COMPLETED 8-24-87
17. ELEVATION TOP OF HOLE: 367.0
18. TOTAL CORE RECOVERY FOR BORING: 98 %
19. SIGNATURE OF INSPECTOR: James W McCoy

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			SET ODEX CASING TO 20.5 FT. NO Samples			Water @ 66', some pressure
287	80					
	81					Clean with revert, FishTail and roller bit
	82		Brown and gray Gravel, TO 1.5 in., some sand (GP)	(9")	J-1	Drive 1 86 75/10.2' 88.9' of A rods
	83					Clean with revert and roller bit for all samples below J-1 0.6 FT. Slough
	84		Top- Sand, coarse TO fine, possible wash	(12")	J-2	Drive 2 8 45
			Bottom 2 in.- Brown, coarse TO fine Sand, mostly med. TO fine, some med. TO fine gravel, Tr. nonplastic fines, very dense (SP)			88.9' of rods 65
282	85					
	26					Clean TO 87.7
	87		Gray and brown, Gravelly Sand, few angular gravel frags TO 1.25", coarse TO med, mostly coarse sand, Tr. non-plastic fines (SP)	(3")	J-3	Drive 3 117/10.4' 88.9' of A rods
	88					
	89					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. FRANKLIN FALLS DAM

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 367.0 | Hole No. FD-87-1

PROJECT: Franklin Falls Dam | INSTALLATION | SHEET 2 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	89					Clean to 89.1 Ft
			Brown Sand, coarse to med, Some gravel to 1.5 in, Tr. non-plastic fines, very dense (SP)		J-4	Drive 4 38 65 70
278	90			(9")		93.9' of A rods
	91					(No sample at 91.6' due to error in depth measurement by driller)
	92					
	93					Clean to 93.7' 0.6' Slough
			Gray micaceous silty fine Sand, very dense (SM)		J-5	Drive 5 40 74
	94			(10")		67/0.3' 98.9' of A rods
273	95					
	96					Clean to 96.4'
			Same as above (SM)			Drive 6 29 52
	97			(11")	J-6	98.9' of A rods 94
	98					0.6' Slough
						26 Clean to 98.7
268	99		Same as above (SM)	(8")	J-7	Drive 7 26 86 103.9' of A rods
267	100					

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 367.0 | Hole No. FD-87-1

PROJECT Franklin Falls Dam | INSTALLATION | SHEET 3 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						0.5' Slough
	101					clean TO 101.2 39
			Same as above (SM)		J-8	Drive 8 70
	102			(10")		108.9' of A rods 75
	103					clean TO 103.9'
	104					Drive 9 36
			Similar TO above. Brown micaceous silty fine sand, very dense (SM)		J-9	63
262	105			(10")		108.9' of A rods 77
	106					clean TO 106.4'
						DRIVE -10 37
	107		Same as above (SM)	(11")	J-10	113.9 Ft. of 'A' rod 46 73
	108					
	109					clean to 109.0
						DRIVE -11 57
			Same as above (SM)	(15")	J-11	113.9 Ft. of A-rods 90
257	110					
	111		Brown Silty fine Sand with few 1/8" to 1/4" thick layer of grey plastic clay (SM)			0.4' Slough
				(12")	J-12	clean TO 111.5 DRIVE -12

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 367.0	Hole No. FD-87-1
PROJECT Franklin Falls Dam, N.H.	INSTALLATION	SHEET 4 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	112				J-12	112.6
	113					0.2' slough; clean to 119
252	114–115		Brown Silty fine to medium SAND, mica, Very Dense (SM)	(13")	J-13	35 / 65 / 78; 115.3
	116					0.3' slough; clean to 116.5
250	117		Light brown micaceous Silty fine to medium SAND, Very Dense (SM)	(15")	J-14	37 / 46 / 67; 117.7
	118					0.1' slough; clean to 119.0
	119–120		Light Brown micaceous Silty fine to medium Sand, Very dense (SM)	(15")	J-15	loss of Drilling fluid occurred at 118–119 approx 75 to 100 gallons; 45 / 90 / 88; 120.4
	121					4" casing installed to 120 ft. 0.2' slough; clean to 121.5
	122		Brown micaceous Silty fine Sand, very dense (SM)	(12")	J-16	Drive 16 125 ft of A-rods; 66 / 75 / 87
	123					
	124					

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 367.0 | **Hole No.** FD-87-1

PROJECT Franklin Falls Dam, NH. | INSTALLATION | SHEET 5 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	124					0.1' slough clean to 124.3
	125		Same as above (SM)	(11")	J-17	Drive 17 31 129 ft of 52 A rods 66
	126					0.1' Slough clean to 126.5
240	127		Same as above (SM)	(9")	J-18	Drive 18 35 130 ft of 48 A-rods 56
	128					clean to 129.0
	129		Same as above (SM)	(11")	J-19	Drive 19 22 40 135 ft of 50 A rods
	130					0.1' slough clean to 131.5
	131					
	132		Same as above (SM)	(11")	J-20	Drive 20 25 135 ft of 45 A-rods 55
	133					clean to 134.0
	134		Same as above (SM)	(10")	J-21	Drive 21 23 137 ft of 42 A-rods 57
	135					

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 367.0 | **Hole No.** FD-27-1

PROJECT Franklin Falls Dam | INSTALLATION | SHEET 5 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	136					Clean to 136.5
230	137		Same as above (SM)	(14")	J-22	Drive 22 140 ft of A-rods 22 41 73
	138					Clean to 139.0
	139		Orange and orange-brown Silty micaceous sand, med. to fine, Some Coarse to fine gravel to 1 in., very dense (SP)	(8")	J-23	Drive 23 142 ft. of A-rods 51 44 101
	140					
	141					0.5' of slough Clean to 141.5
	142		Brown and gray Sandy gravel, coarse to fine gravel to 1 in., coarse to fine, mostly coarse to med. sand., mica, very dense (GP-GW)	(7")	J-24	Drive 24 145 ft. of A-rods 103 88/0.3'
	143					
	144					Clean to 144.8'
	145		Brown & gray Sandy gravel, coarse to fine gravel to 1.5 in, coarse to medium, mostly coarse, sand, some nonplastic fines (GP-GW) very dense.	(3")	J-25	Drive 25 150' of A-rods 130/0.3'
	148					
220	147		Brown Sand, medium to fine, tr. nonplastic fines very dens- (SP)	(7")	J-26	Clean to 147.7' Drive 26 152 ft of A-rods
	148					

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 367.0 | **Hole No.** FD-87-1

PROJECT: Franklin Falls Dam | INSTALLATION | SHEET 7 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	148					
	149					Clean to 149.6'
	150		Brown Sand, coarse to fine, mostly medium, few gravel frags. To 0.75 in., very dense (SP)	(6")	J-27	Drive 27 155 ft of A-rods 112/0.5'
	151					
215	152					
	153					
	154		TOP 16" - Broken to very broken gray Granite with brown silty clay filled joints	Rec= 98%		
	155		Mid 38" - Massive hard gray Granite, few high angle joints with some silty clay in joints		Run 1	
	156		Bottom 6" - Very broken hard gray Granite with some silty clay and iron stains along joints	RQD= 84%		
210	157					
	158					
			Bottom of Boring at 158.3'			
	159					

STANDAI PENETRATION TEST

Project Franklin Falls Dam

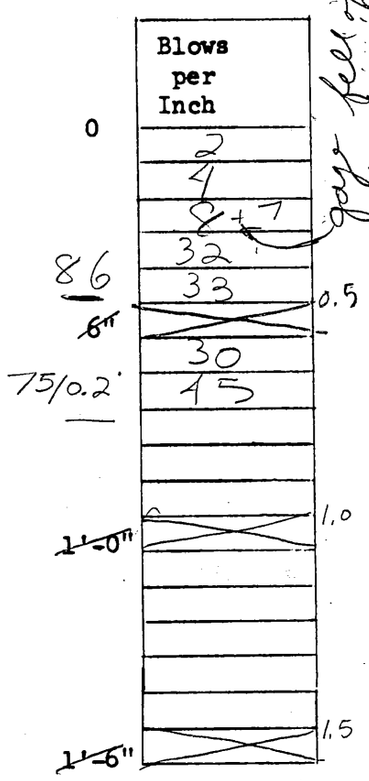
Page 1 of 14

Hole No. FD-87-1

Date 8-5-87

Depth of Test 81.6 to 82.3

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

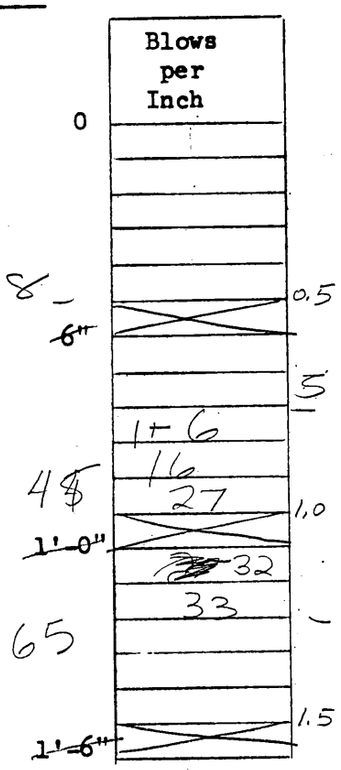


Remarks

guy fell off and then tightened

Depth of Test 83.5 to 84.7

Blow	Gage Reading	Penetration per Blow
~~X~~		
1	0.1	0.1
2	.25	0.15
3	.32	0.07
4	.4	0.08
5	.45	.05
6	.5	.05
7		.05
8	.55	
9	.6	.05
10	.62	.02
11	.65	.03
12	.68	.03
13	.70	.02
14	.72	.02
15		
16		
17		
18		
19		
20		



Remarks

0.6' sloughed

STANDAI. PENETRATION TEST

Project Franklin Falls Dam

Page 2 of 14

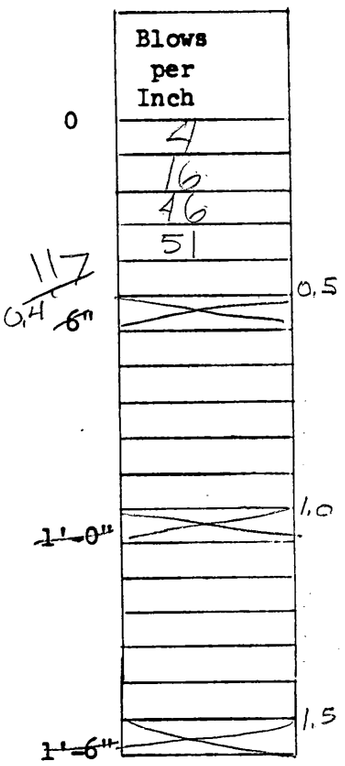
Hole No. FD-87-1

Date 8-6-87

88.9
2.7
86.8

Depth of Test 86.8 to 87.2

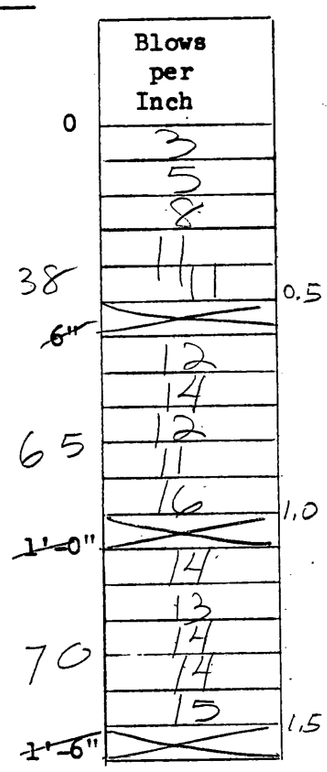
Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks Drive 3

Depth of Test 89.1 to 90.6

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks Drive 4

STANDARD PENETRATION TEST

Project Franklin Falls Dam

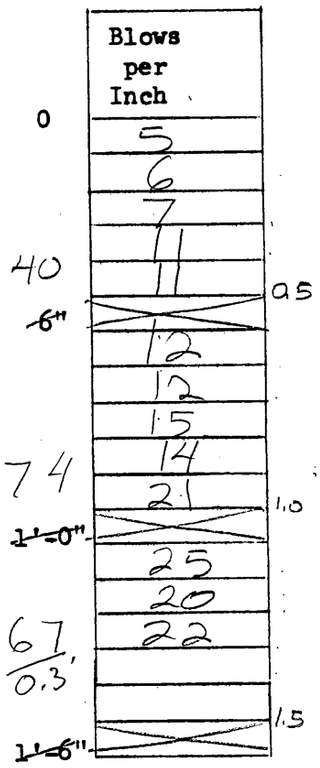
Page 3 of 14

Hole No. FD-87-1

Date 8-6-87

Depth of Test 93.1 to 94.4

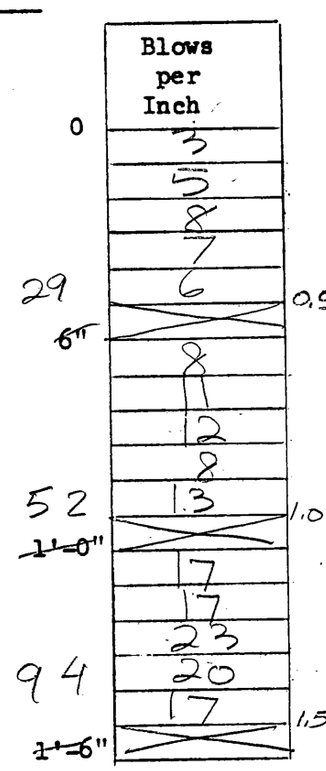
Blow	Gage Reading	Penetration per Blow
~~6"~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks Drive 5
0.6' slough

Depth of Test 96.4 to 97.9

Blow	Gage Reading	Penetration per Blow
~~6"~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks Drive 6

STANDARD PENETRATION TEST

Project Franklin Falls Dam

Page 4 of 14

Hole No. FD-87-1

Date 8-6-87

Depth of Test 98.1 to 99.6

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Blows per Inch

0

4
3
5
6
26 8 0.5
~~6"~~
11
10
13
65 15
16 1.0
~~1'-0"~~
14
13
20
86 22
17 1.5
~~1'-6"~~

Remarks: Drive 7
0.6' slough

Depth of Test 100.7 to 102.2

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Blows per Inch

0

4
5
8
12
39 10 0.5
~~6"~~
16
14
13
70 12
15 1.0
~~1'-0"~~
15
14
14
75 15
17 1.5
~~1'-6"~~

Remarks: Drive 8
0.5' slough

STANDARD PENETRATION TEST

Project Franklin Falls Dam

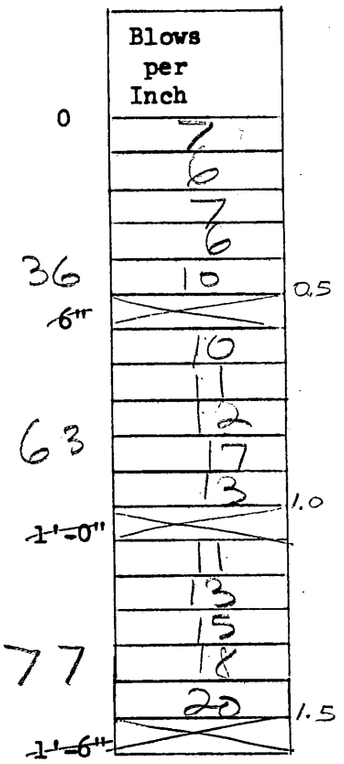
Page 5 of 14

Hole No. FD-87-1

Date 8-6-87

Depth of Test 103.9 to 105.4

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



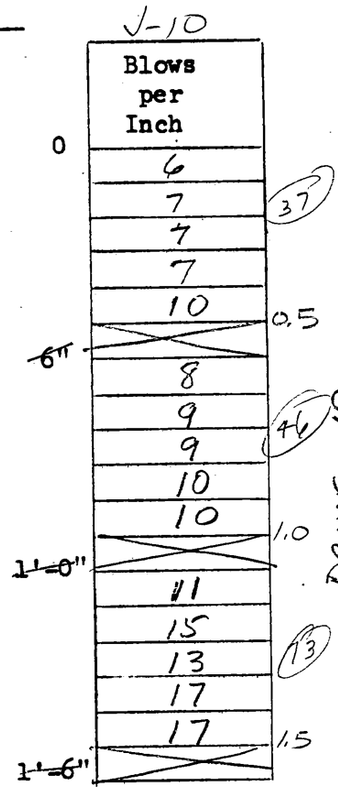
Remarks Drive 9

Date 8/7/87

Depth of Test 106.5 to 109.0

J-10

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks DRIVE -10
NO unusual driving condition occurred
NO Slough prior to sampling

STANDARD P ETRATION TEST

Project Franklin Falls Dam

Page 6 of 14

Hole No. FD-87-1

Date 8-7-87

rods 113.9
stick up 5.2
108.7
Drove to seat sampler to 109.0

Depth of Test 109.0 to 110.5

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

J-11

	Blows per Inch	
0	8	
	10	
(57)	12	
	13	
	14	0.5
6"		
	18	
(90)	18	
	17	
	18	
	19	1.0
1'-0"		
	17	
(90)	14	
	17	
	19	
	23	1.5
1'-6"		

DRIVE-11

Remarks: Sloughed to 109 Sampler on 108.7
Driller had to stop hammer momentarily to rest arm during last 6"
No unusual conditions observed during wash or Sampling

Depth of Test 111.1 to 112.6

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

J-12

	Blows per Inch	
0	6	
	7	
(41)	9	
	9	
	10	0.5
6"		
	5	
	7	
(34)	6	
	8	
	8	1.0
1'-0"		
	10	
	10	
(79)	15	
	20	
	24	1.5
1'-6"		

DRIVE-12

Remarks: Sloughed to 111.5 bent Sampler at 111.1
Stopped hammer intermittently as thigh 6" to rest arm
No unusual conditions observed during wash or Sample.

STANDARD I ETRATION TEST

Project Franklin Falls Dam Page 7 of 14

Hole No. FD-87-1 Date 8-7-1987

Depth of Test 113.8 to 115.3

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

V-13

	Blows per Inch	
0	6	
	7	
(35)	6	
	8	
	8	
6"	~~X~~	0.5
	9	
	13	
(65)	14	
	14	
	15	
1'-0"	~~X~~	1.0
	15	
	15	
(78)	15	
	16	
	17	
1'-6"	~~X~~	1.5

DRIVE - 13

Remarks: Washed to depth 114.0, Slough 0.2' Sampled from 113.8' No unusual conditions observed during Wash or sampling. Again driller rested arm at the last 6" of sampling.

Depth of Test 116.2 to 117.7

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

V-14

	Blows per Inch	
0	5	
	10	
(37)	9	
	7	
	6	
6"	~~X~~	0.5
	7	
	8	
(46)	10	
	10	
	11	
1'-0"	~~X~~	1.0
	11	
	12	
(67)	14	
	14	
	16	
1'-6"	~~X~~	1.5

DRIVE - 14 Slough 0.3ft

Remarks: Light Brown micaceous silty fine to medium SAND, Very dense. No unusual conditions observed during drilling and Sampling

STANDARD 1 ETRATION TEST

Project Franklin Falls Dam — Page 8 of 14

Hole No. FD-87-1 — Date 8-7-1987

Depth of Test 118.9 to 120.4

J-15

Blow	Gage Reading	Penetration per Blow
☒		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per Inch	
0	5	
	7	
(45)	9	
	12	
	12	0.5
6"	☒	
	13	
	16	
(90)	18	
	17	
	26	1.0
1'-0"	☒	
	28	
(88)	14	
	14	
	15	
	17	1.5
1'-6"	☒	

Remarks: Drive ~15 slough 0.1 ft. loss of drilling fluid occurred between depths 117'-118', lost approx 70 to 100 gallons. light brown micaceous silty fine to medium SAND. Very dense

J-16

Depth of Test 121.3 to 122.8

Blow	Gage Reading	Penetration per Blow
☒		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per Inch	
0	4	
	10	
	12	
	16	
60	18	0.5
6"	☒	
	16	
	12	
	13	
75	14	
	18	1.0
1'-0"	☒	
	16	
	15	
87	18	
	20	
	18	1.5
1'-6"	☒	

Remarks: Connector between A-rod + hammer bending during driving. Sample clean - no coarse sand slough on top of sample 0.2'

STANDARD 1 ETRATION TEST

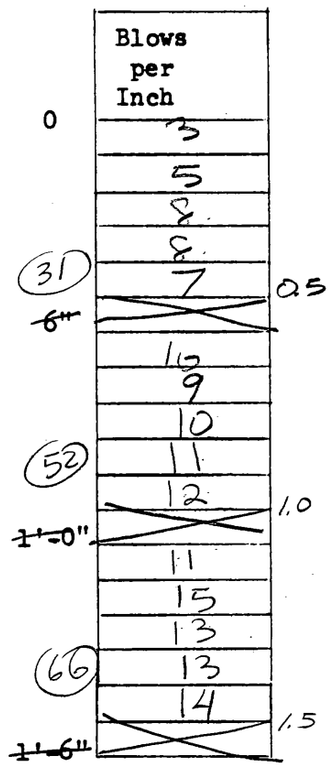
Project Franklin Falls Dam Page 9 of 14

Hole No. FD-87-1 Date 8-11-87

J-17

Depth of Test 124.2 to 125.7

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

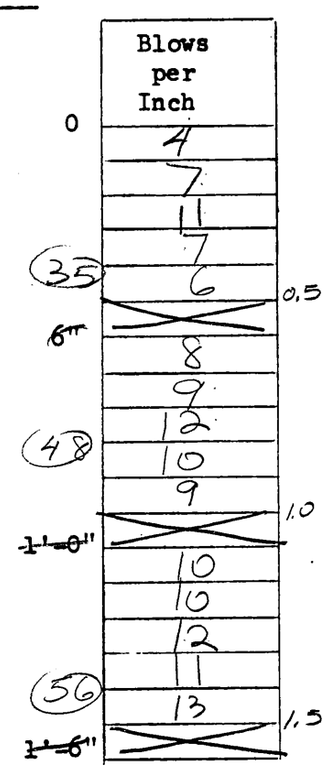


Remarks 0.1' slough

J-18

Depth of Test 126.4 to 127.9

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks 0.1' slough

STANDARD 1 ETRATION TEST

Project Franklin Falls Dam Page 10 of 14

Hole No. FD-87-1 Date 8-11-87

J-19

Depth of Test 129.0 to 130.5

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per Inch	
0	2	
	4	
	4	
	4	
(22)	8	0.5
~~6"~~	~~10~~	
	7	
	8	
	7	
	8	
(40)	10	1.0
~~1'-0"~~	~~19~~	
	9	
	11	
	10	
(50)	10	
	10	1.5
~~1'-6"~~	~~20~~	

Remarks

8-12-87

J-20

Depth of Test 131.4 to 132.9

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per Inch	
0	3	
	4	
	4	
(25)	5	
	9	0.5
~~6"~~	~~17~~	
	8	
	9	
	10	
(45)	8	
	10	1.0
~~1'-0"~~	~~18~~	
	10	
	8	
	14	
(55)	13	
	10	1.5
~~1'-6"~~	~~23~~	

Remarks 0.1' slough

STANDARD PENETRATION TEST

Project Franklin Falls Dam

Page 11 of 14

Hole No. FD-87-1

Date 8-19-87

J-21

Depth of Test 134.0 to 135.5

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Blows per Inch

0

2
4
5
5
(23) 7
~~6"~~ ~~8~~ 0.5
8
9
(47) 10
9
~~1'-0"~~ 1.0
10
9
11
(52) 11
11
~~1'-6"~~ 1.5

Remarks

Hammer adapter weld failed and hammer not coming straight down on rods consistently. Driller requested replacement be sent with new helper, but it was not sent.

J-22

Depth of Test 136.5 to 138.0

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Blows per Inch

0

2
5
4
6
(22) 3
~~6"~~ 0.5
5
7
9
(41) 9
11
~~1'-0"~~ 1.0
14
13
12
(73) 14
20
~~1'-6"~~ 1.5

Remarks

Rods + hammer wrong around a lot

STANDARD PENETRATION TEST

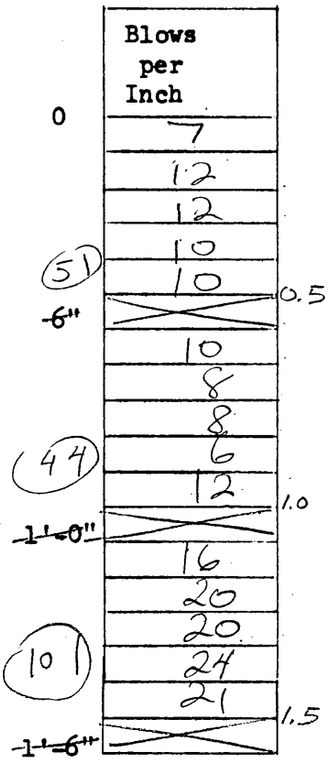
Project Franklin Falls Dam Page 12 of 14

Hole No. FD-87-1 Date 8-14-87

J-23

Depth of Test 139.0 to 1405

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

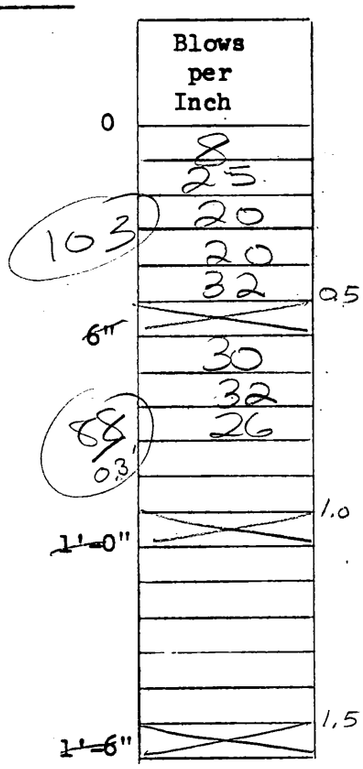


Remarks Hammer + rods moving around

J-24

Depth of Test 142.0 to 143.5

Blow	Gage Reading	Penetration per Blow
~~1~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks 0.5' slough

STANDARD PENETRATION TEST

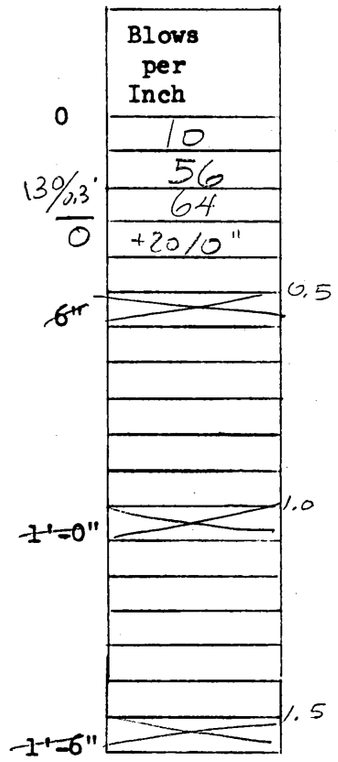
Project Franklin Falls Dam Page 13 of 14

Hole No. FD-87-1 Date 8-17-87

J-25

Depth of Test 144.8 to 145.1

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

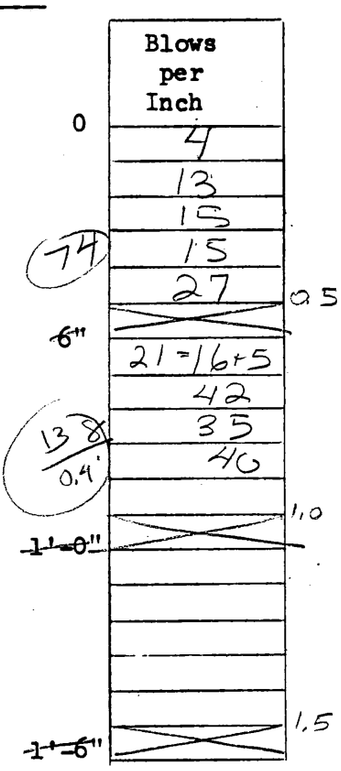


Remarks: Hard cleaning before sample Taken. Hammer + rods bouncing after 0.3'

J-26

Depth of Test 147.1 to 148.0

Blow	Gage Reading	Penetration per Blow
~~X~~		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks:

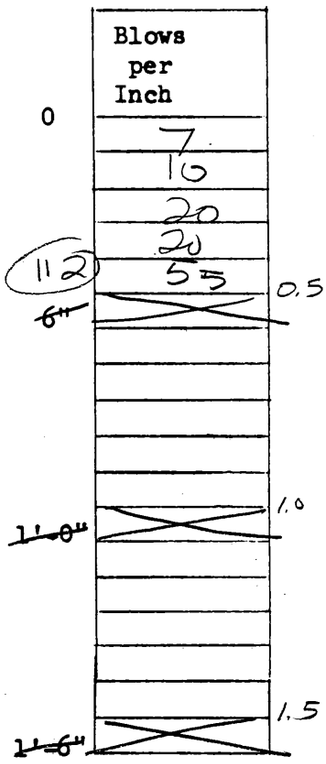
STANDARD P. ETRATION TEST

Project Franklin Falls Dam Page 14 of 14

Hole No. FD-87-7 Date 8-17-87

J-27
Depth of Test 149.6 to 150.5

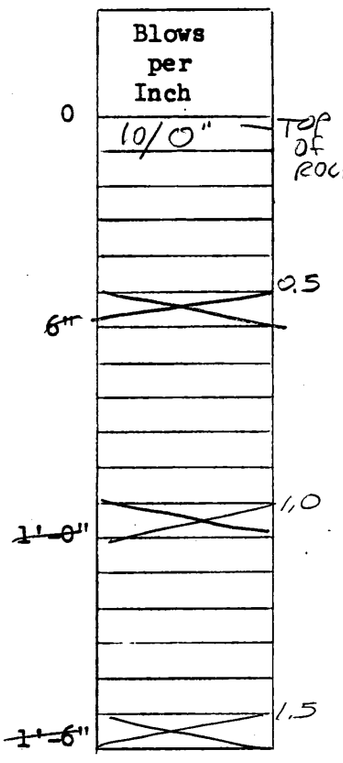
Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks

J-28
Depth of Test 152.1 to

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Remarks

10 blows - rods bouncing - no penetration (Sounds like rock)